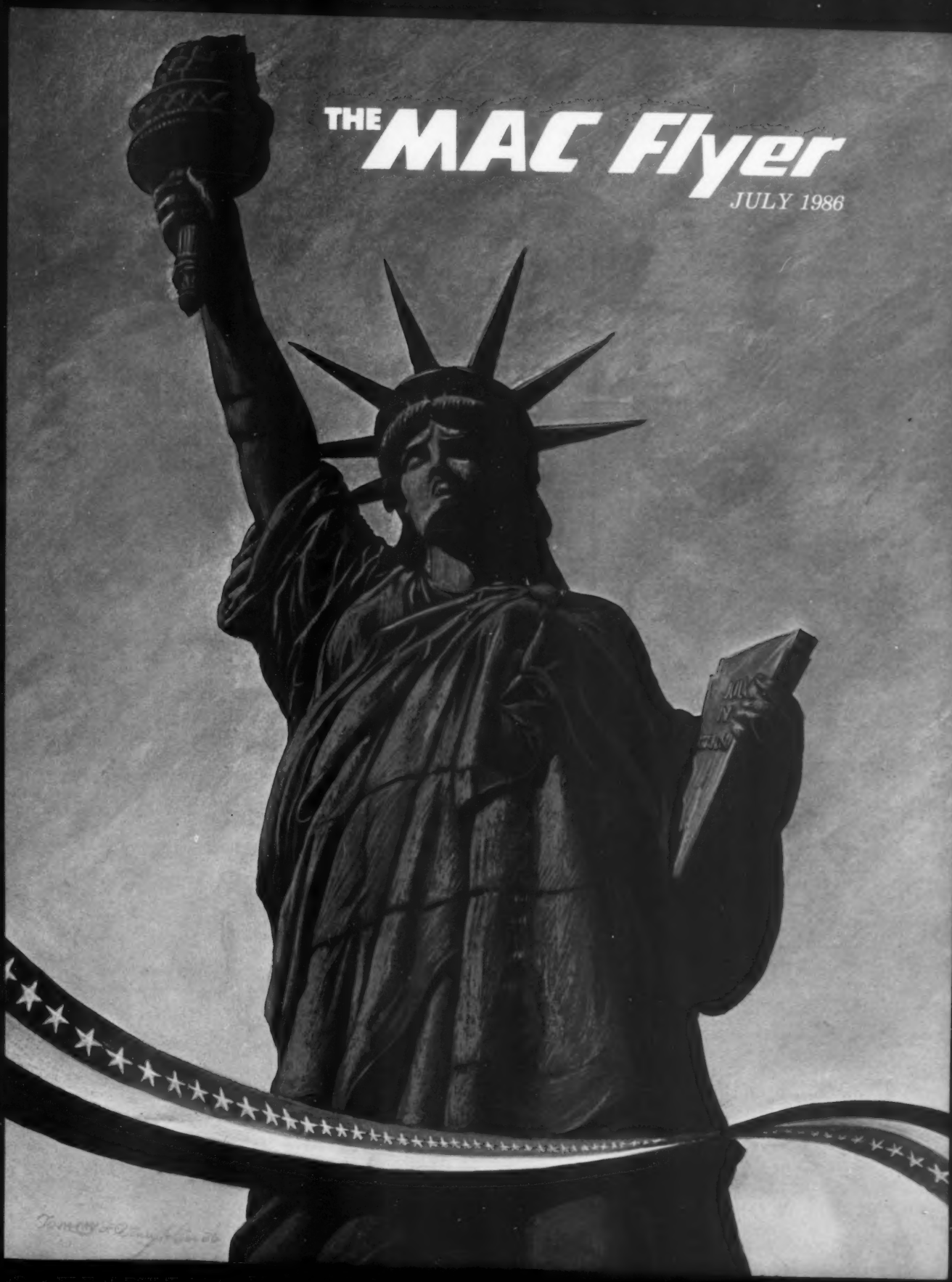
THE MAC Flyer
JULY 1986

THE MAC Flyer

For Greater Safety in MAC Air Operations

July 1986 | MACRP 127-5 | VOL XXXII NO. 7

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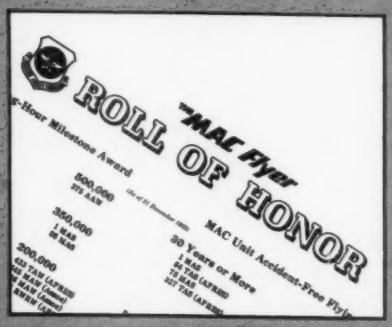

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The MAC Flyer is published by the Director of Safety, Military Airlift Command. The contents are informative and not regulatory or directive. Names of people and places in mishap stories are representative and not necessarily of the aircraft or equipment involved. Information in any article may not be construed as incriminating under Article 31, UCMJ.

Contributions, comments and criticisms are welcome. Write: *The MAC Flyer*, HQ MAC/IGFE, Scott AFB, IL 62225-5101, or Autovon 576-3534. The editors reserve the right to make any editorial changes in manuscripts which they believe will improve the material without altering the intended meaning.

Subscriptions are available from: The Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Changes of address for subscription mailing should be sent to GPO. Give both old and new addresses, including zip codes. USAF Active and Air Reserve Forces units establish requirements for this magazine through their publication distributor (DAPD). Other U.S. Military units should consult administrative directives. *The MAC Flyer* is published at an approximate rate of one magazine for every five MAC aircrew members, and one for every twenty MAC Support personnel. Distribution X; OPR: HQ MAC/IGFE ISSN 0024-788X.

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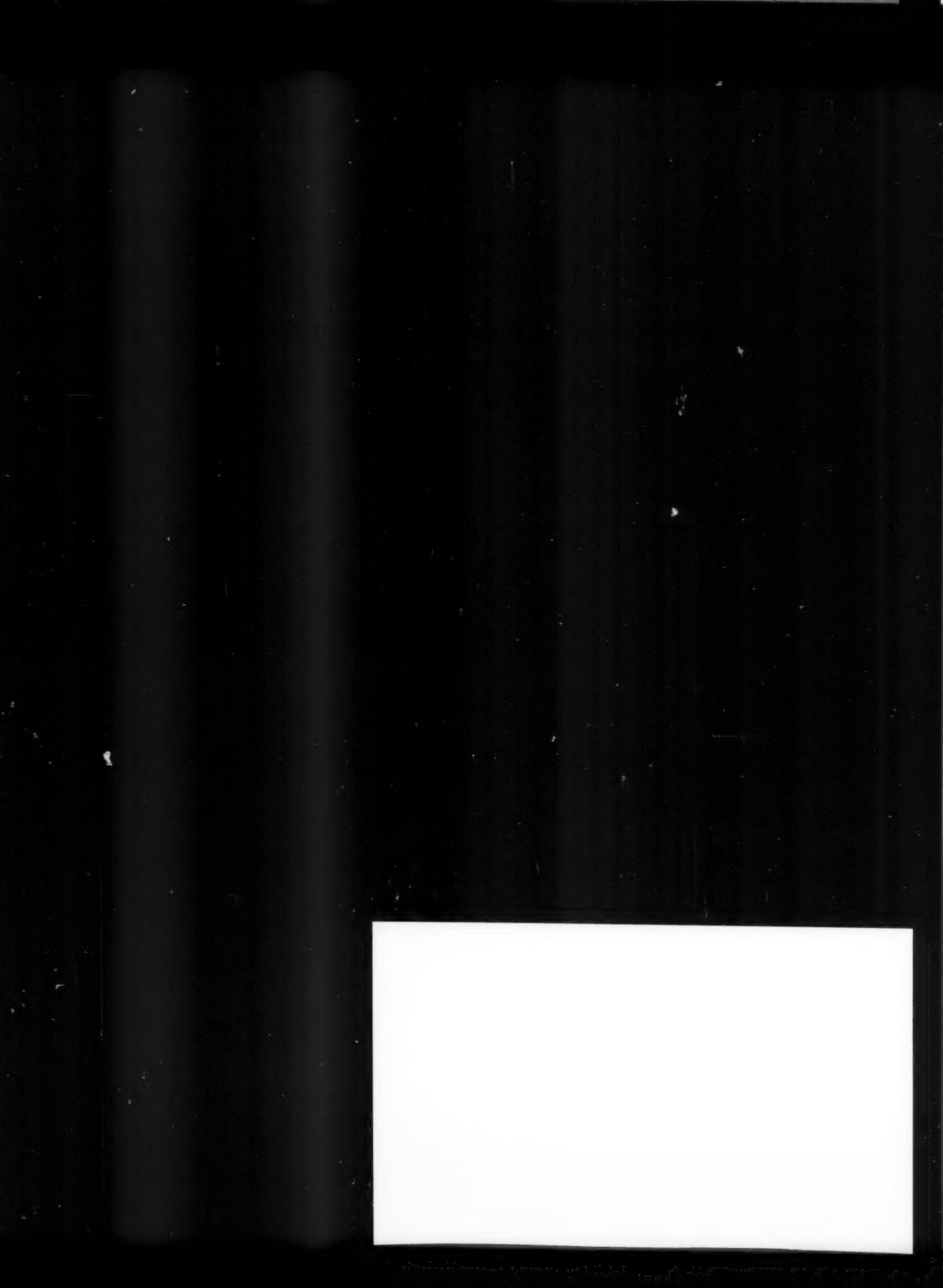
INCORRECT VOLUME NUMBER, SHOULD READ #33



Liberty!

MAC's role.

In this issue of *The MAC Flyer* we're celebrating the 100th birthday of the Statue of Liberty, a symbol that stands for the United States of America.

While the statue was a gift from the people of France, the people of the United States provided the Statue's base, which cost as much as the Statue itself.

It's also taken a great amount of money and work on our part to keep the Statue as a fitting symbol of liberty. We strengthened and repaired the Statue in 1937, and the repair work that is being completed now—at a cost many times as expensive as the original Statue—comes from the donations of many Americans—from industries to school children.

The point of all this is that someone else can give you your liberty, but you must establish the base yourself; you have to take care of liberty or it will crumble. That takes courage and continual effort.

The Military Airlift Command is an essential part of the base on which our freedom rests; we are vital in taking care of freedom around the world. The stakes are very high and we must persevere. The alternatives are simply unacceptable.

Insuring this freedom takes a lot of day-to-day effort. We're flying more challenging and realistic missions than ever before, and I'm proud that at the same time we're flying more safely than ever.

The Chief of Staff Award presented to MAC in March for exceptional achievement in flight safety during 1985 stands as an eloquent and powerful statement of your competence and readiness.

This country expects you to keep MAC ready to respond to challenges anywhere in this unstable world. Flying safely will ensure this readiness and will secure this country's freedom in the future.

THE WINNERS

1986 MAC FLIGHT SAFETY WRITING CONTEST

First Place

"Pound Fuelish"
By TSgt. Bruce F. Hanke
163 CAMS (ANG)
March AFB, California

Second Place

"In Over His Head"
By 1st Lt. Leonard M. Cohen
Det 8, 37 ARRS
Vandenberg AFB, California

Third Place

"Who's in Command?"
By Capt. Mark E. Cioffi
1 HS
Andrews AFB, Maryland

Special Category Winners

"Messages from Future Past"
By Mr. James B. Zazas
Carthage, North Carolina

" A Twilight Trip"
By Maj.Grover C. Tate, Jr, USAF (Ret)
Joshua, Texas

"If At First. . ."
By Mr. Roger Marchant
Narrabundah, Australia

Honorable Mention Winners

"Two Miles Short"
By Capt. Peter D. Pasko
8 FTS
Vance AFB, Oklahoma

"Asleep in the Eye of a Typhoon"
By Maj. James C. Orr
HQ MAC/TR
Scott AFB, Illinois

"Careless Habits"
By Capt. Anne Martin
437 MAW
Charleston AFB, South Carolina

"A Certified Tragedy"
By Capt. Thomas A. Farrier
89 MAW
Andrews AFB, Maryland

"You're the Boss"
By Maj. Paul C. Robertson
438 ABG
McGuire AFB, New Jersey

"Mission Oriented"
By Lt Col. Edward M. Duchnowski
97 MAS (Assoc)
McChord AFB, Washington

"A Christmas Message"
By Capt. Keith A. Quinn
4950 TW
Wright-Patterson AFB, Ohio

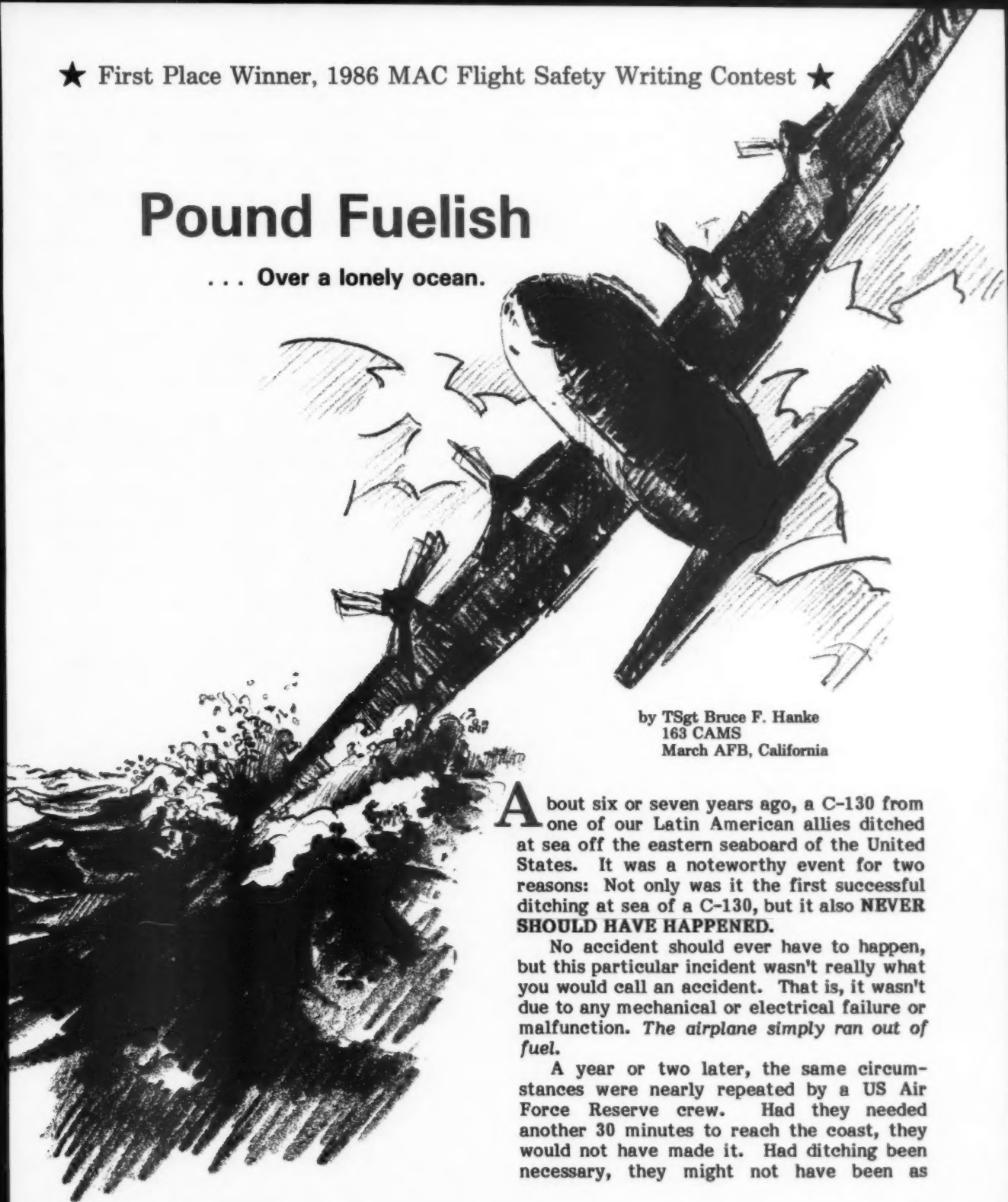
"The Sky is Blue"
By Maj. George E. Nolly
1403 MAS
Yokota AB, Japan

"The Fangs that Bite"
By TSgt. William R. Madden
702 MAS (Assoc)
Mc Guire AFB, New Jersey

★ First Place Winner, 1986 MAC Flight Safety Writing Contest ★

Pound Fuelish

. . . Over a lonely ocean.



by TSgt Bruce F. Hanke
163 CAMS
March AFB, California

About six or seven years ago, a C-130 from one of our Latin American allies ditched at sea off the eastern seaboard of the United States. It was a noteworthy event for two reasons: Not only was it the first successful ditching at sea of a C-130, but it also **NEVER SHOULD HAVE HAPPENED.**

No accident should ever have to happen, but this particular incident wasn't really what you would call an accident. That is, it wasn't due to any mechanical or electrical failure or malfunction. *The airplane simply ran out of fuel.*

A year or two later, the same circumstances were nearly repeated by a US Air Force Reserve crew. Had they needed another 30 minutes to reach the coast, they would not have made it. Had ditching been necessary, they might not have been as

successful as that first C-130 crew.

Fate was kind, but with the exception of a few details the following story is what might have happened had Lady Luck not narrowly intervened.

Fear overtook Hillerman as he carefully scanned the fuel guages. The totalizer indicated 4,800 lbs of fuel remaining. Instinct told him he should have headed for St. John's. Maj. Tom Hillerman grew visibly more worried.

"Don't worry about it, sir, we'll make it. We've always managed to squeeze out of tight places before. Besides, I've got faith in this old box lunch bomber." Sgt. Mike Weller, the flight engineer, appeared more optimistic than the rest of the crew, but deep inside, he too was beginning to feel more jittery by the minute.

The mission began without a hitch, but was rapidly losing its appeal. Eleven days earlier, the crew of Military Airlift Command's "Watch 97" departed the continental United States on what started as a routine milk run. Some of the workdays were long and hard, but two days of roaming around Frankfurt made up for all of that. There was so much to see and do in the old German city that any amount of work was worth doing to see it. The crew visited centuries-old cathedrals, took the Rhine River tour, visited historic Sachsenhausen, and even spent several hours wandering through the train station and nearby shops and sidewalk cafes. Of course, the old American custom of buying massive quantities of souvenirs wasn't overlooked either.

For the return trip, the crew stocked the cargo compartment of the old 'A' model Herk full with the fruits of those two shopping days—German beer, cuckoo clocks from the Black Forest, wooden nutcrackers, and fine Rhine wines. Before departure, Sgt. Rick Velasko, the loadmaster, noted the cargo looked like Viking's plunder from days of old.

After the airplane was serviced, Hillerman notified Operations the airplane was ready for departure and they were ready for passenger boarding. A few minutes later, the shuttle bus dropped three people in front of the aircraft, and Watch 97 departed Rhein-Main Air Base at 0620.

But before the big hop across the pond, Watch 97 stopped at Lajes Field in the Azores for refueling. The old 'A' model doesn't have the range of the newer C-130s, so Lajes Field and St. John's in Newfoundland were necessary waypoints for most return flights. But this trip would be a little different. Navigator Tony Santini calculated the St. John's stopover wouldn't be necessary this time; they could make the run straight from Lajes to the United States with fuel to spare. That way they could cut one day off the trip by bypassing Newfoundland.

"You're absolutely sure we can make it, Tony?" Hillerman recalled quizzing the navigator earlier that morning.

"No sweat," guaranteed Santini, "tailwinds are with us today."

Capt. Tony Santini was a confident navigator. Maybe a little too confident. He was the type who rarely made mistakes. The type who tries to get by on the least amount of effort required to get the job done—and for some things that's okay—but navigating a multimillion dollar airplane around the globe isn't one of those things. That didn't matter to Tony Santini, though. You see, he hadn't learned that lesson yet. He would have to learn the hard way.

Santini was one of those Ivy League graduates—clean cut, athletic, and fiercely competitive. Stereotypically so. No one could tell him what to do or how to do it. No one could tell him anything.

He always appeared cocky and a little too sure of himself. Whatever the situation, Tony Santini attempted to take command of it. He always had to be in charge and run things his way. He accepted advice from no one—"Wise men don't need it," he'd always said. Unfortunately, he forgot the other half of the old saying about advice: ". . . and fools don't heed it." *That was Tony Santini.*

And when it came to navigating an airplane, he got by on only what he had to do, his way. Practicing celestial shots was ancient and unnecessary according to his philosophy, and ADF fixes were "stone age." He even joked about being a "naviguesser." *That was Tony Santini.*

Now, a little more than an hour from the US coast, the fuel remaining was down to 4,800 lbs—barely enough to "squeak in," with luck. If they made it, there would be a lot of questions to answer. No doubt heads would roll.

Minimum fuel should be at least 6,000 lbs overhead destination, but we'll be lucky to have 600, thought Weller. There'll be hell to pay, that's for sure. And I'll probably get the blame!

Hillerman mulled over the past few hours in his mind, wishing he'd paid closer attention to his instincts and filed for St. John's like he wanted to in the first place. Below normal headwinds were expected, and they should have been able to make the run straight from Lajes. The 36,000 lbs of fuel that the C-130 held should have been plenty. But there were too many "ifs" and "should haves," and hindsight wasn't going to help them out of this one.

Unfortunately, he forgot the other half of the old saying about advice: "... and fools don't heed it."

Groundspeed had dropped slightly below what they'd calculated for the first hour or two of flight, but he'd decided to press on anyway. Santini assured everyone the airplane would still make it with no problems. But now, the crew of Watch 97 wasn't so sure about that. And Tony Santini appeared to be losing some of his confidence. Hillerman wondered if he hadn't made a big mistake today. Or several mistakes.

Tom Hillerman was a topnotch pilot. One of the unit's best. No one ever questioned that. Hillerman himself knew that his own abilities far exceeded some of his peers'. He'd been a C-130 aircraft commander for almost seven years and loved every minute of it. His safety record was outstanding, and he had even saved an aircraft from destruction three years earlier on a routine night training mission that ended up not-so-routine. But he also knew he was fallible, like all humans. That was one of Hillerman's good points. He never put himself above anyone, and he always relied on other crewmembers' abilities to do their jobs. Putting his faith in his fellow flyers' abilities, he called it. Maybe he shouldn't be so trusting, he thought ....

Turbulence brought Hillerman back to reality.

"Well, you guys know how notoriously unreliable these fuel guages are," suggested Hillerman's copilot, Capt. Neil Dietrich. "These old 'A' model fuel gauges aren't exactly known for their precision, you know." He studied the fuel panel thoughtfully, not really believing what he'd just said. "They always have more than they actually read," Dietrich added with some hesitation.

"Well, I've never seem 'em lie, other than an occasional malfunction, and besides, I'm not sure I like the idea of testing your theory at this point," stated Hillerman matter-of-factly. He continued, "Sure, we joke a lot about their accuracy, but right now that's of no consequence. What we've gotta do is figure out how to get out of this mess before we make like a submarine."

"What about shutting down the outboards to conserve fuel," offered Weller.

Hillerman paused. "Well, I don't know about that. It would probably do more harm than good. Let's just shut one down and try to keep this thing trimmed up straight for now, and pray for the best." Hillerman had the copilot feather the number-1 engine.

The groundspeed indicator had clicked its way down another 10 knots in the last 20 minutes, and Tony Santini had felt each click penetrate his soul as though they were punch marks for his ticket through the pearly gates. The increased drift made matters worse. Tony Santini's confidence was nearly gone.

"I . . . , look guys," Santini stammered slowly. "I'm sorry for this mess, but I didn't know .... I didn't think this would happen. I thought we'd be able to make it. I was sure we'd be able to make it." He felt ill at ease admitting any responsibility at all, but he knew their predicament was at least partially his fault.

"Yeah," Hillerman began, "I suppose I could make a big speech about how you screwed up and all that, or about how I am going to wring your neck when we get back, but the truth of the matter is we're all in this together. In our great desire to save time getting home, none of us questioned your judgment. We've made this run before. Several times. We all knew what we could

and could not get by with. Sure, we skipped St. John's once before and made it, but right now that's irrelevant."

Hillerman paused briefly and continued: "We took a chance. We all figured it'd never happen to us. It was an unspoken chance, but nevertheless a chance. No, Tony, it's not all your fault. We share equally in the blame."

No one else spoke and another 20 minutes dragged by. The loadmaster paced nervously in the cargo compartment as he broke out his remaining pack of cigarettes, offering one to everyone. He was intent on smoking the whole pack while he still had the chance. No one needed to ask Rick Velasco if he was nervous, and he made little attempt to hide his fear from the three passengers.

The outboard TANK EMPTY light for the number-4 tank blinked momentarily, then lit up. The number-4 fuel quantity indicator read barely more than 300 lbs. The number-1 tank had already transferred dry, and all engines were still running normally except the one Hillerman had shut down earlier. The inboard needles showed about 500 lbs each. Barely enough for half an hour, if that.

"Neil, make the call." Hillerman was sure now. "Call in a MAYDAY and tell 'em we're going to ditch. We're not going to make it, we're too far out. Tell them we'll need the Coast Guard standing by for a rescue. Loadmaster, strap everything down and make sure our passengers are buckled in safely and know what they have to do. Prepare the emergency exits, then everyone strap in and prepare to ditch. At best, we've got about 25 minutes left." Hillerman stopped briefly while he checked his overhead panel.

"As far as I know, only one other C-130 has ever successfully ditched at sea. We're going to be the second."

No one else said anything and 20 minutes later the number-4 fuel quantity indicator touched the zero mark. A few seconds after that the number-4 engine quit. The copilot quickly feathered the propeller.

"Well, Neil, there goes your theory about the accuracy of those gauges," noted Hillerman.

"Yeah. Too bad we had to learn the hard way," said Dietrich, "they appear to be quite accurate."

"A little too accurate," added Weller quietly.

With slightly more than 200 lbs of JP-4 fuel remaining in the inboard tanks, the crew prepared for the watery landing. Hearts pounded rapidly as fear of the inevitable loomed closer than they liked to think. The screaming of the remaining two engines was no longer comforting.

The AC noted the altimeter needles as they passed through 850 ft on their way down. Seven minutes later, the number-2 engine died and Hillerman ordered both feathered simultaneously to enable the C-130 to contact the surface of the sea as cleanly as possible. The silence was frightening.

As the five crewmen and three passengers braced themselves for the roughest landing of their lives, they never saw the 60-foot swell grab the left wingtip and violently wrench the airplane from its planned trajectory. The flimsy metal structure was no match for the powerful forces of nature, and the Herk cartwheeled crazily through the rough sea, pieces flying in every direction. A thousand yards from impact, the mangled hulk of airplane—what remained of it—came to rest and sank rapidly below the waves.

Following his active-duty Air Force service, which included tours at Tuy Hoa AB, Vietnam, Clark AB, Phillippines, and McGuire AFB, NJ, Sergeant Hanke joined the Rhode Island ANG in 1973. His experiences with MAC maintaining C-141s and C-130As ended in March 1985, when he accepted a job as an Avionics Instrument Systems Technician with the California ANG working on the F-4C.

Desert Survival

How to beat the heat.

by Maj. Thomas C. Weinzierl
Supervising Editor

Capt. Abdul Barrani loved the desert night. The cool softness of the night was such a contrast to the searing, inescapable heat of the day. The stars in the moonless sky were so bright he felt he could reach out and touch them.

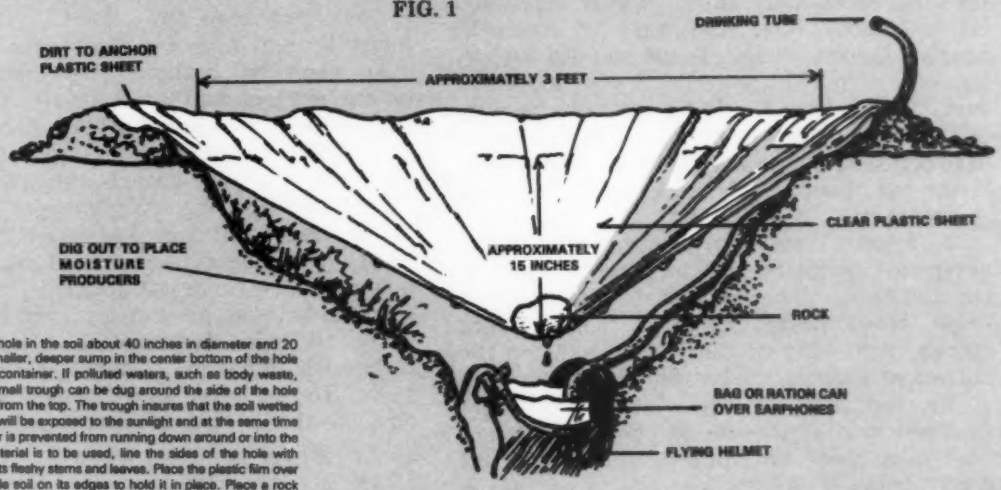
We'll be able to reach that tribe of nomads about noon tomorrow, he thought. The doctor will have his hands full with that typhoid outbreak. Anyway, this mission is a welcome break from fighting those imperialist-backed rebels in the south.

Just as he stubbed out his cigarette he caught the unmistakable drone of a C-130 approaching from the northwest. The captain knew all their transports were busy reinforcing army units. He reached the radio in his command vehicle just as the shadowy giant roared overhead.

"Headquarters, headquarters," he screamed into the mike, "enemy aircraft heading southeast . . . ."

MSgt. Sam Duncan never knew what hit them. One minute he was running through his 10-minute checks and the next he was floating under his parachute to the valley floor below. He heard his C-130 explode as it slammed into the mountains nearby just as he hit the ground. The sound of another airplane caught his attention as he stood up. Must be the fighter that shot us down, he thought. I hope the others got out. Sam, you're one lucky loadmaster. Can't even remember opening the chute. Now what? Here I am, in the middle of a foreign, hostile country, in the desert yet. Somebody saw us coming in, so they may start looking for survivors. I'd better find a good place to hole up till daybreak. Then I can figure out where I am and the best way to evade and get to the pick-up point.

FIG. 1



Dig a bowl-shaped hole in the soil about 40 inches in diameter and 20 inches deep. Add a smaller, deeper sump in the center bottom of the hole to accommodate the container. If polluted waters, such as body waste, are to be purified, a small trough can be dug around the side of the hole about half way down from the top. The trough insures that the soil wetted by the polluted water will be exposed to the sunlight and at the same time that the polluted water is prevented from running down around or into the container. If plant material is to be used, line the sides of the hole with pieces of the plant or its fleshy stems and leaves. Place the plastic film over the hole and put a little soil on its edges to hold it in place. Place a rock no larger than your fist in the center of the plastic and lower the plastic until it is about 15 inches, below ground level. The plastic will now have the shape of a cone.

Put more soil on the plastic around the rim of the hole to hold the cone securely in place and to prevent water vapor losses. Straighten the plastic to form a neat cone with an angle of about 30 degrees so that the water drops will run down and fall into the container in the bottom of the hole. It takes about one hour for the air to become saturated and start condensing on the underside of the plastic cone.

CAUTION
Make sure the plastic cone does not touch the earth anywhere causing loss of water.

Desert Survival

Sam Duncan's predicament has been faced by many crewmembers. Some survived, others didn't. The desert is a hostile place, but knowledge of some basic survival techniques, a cool head, and a will to survive will bring the downed crewmember back to safety again.

Water

Of course, your *biggest* concern in the desert is finding enough water to sustain life. In hot deserts (there *are* cool deserts), you'll need a minimum of a gallon of water a day. If you walk in the cool desert night, you can get about 20 miles for that daily gallon. If you do your walking in daytime heat, you'll be lucky to get 10 miles to the gallon. Whether you sit out your desert survival or walk, you'll need water—at least 3 to 4 quarts a day.

The only way to conserve your water is to ration your sweat. Drink water as you need it, and reduce exposure by keeping your clothes on. Sunburn will just add to your troubles. Stay in the shade, if you can, and save your energy for the cooler nighttime.

Looking for water in the desert won't be easy, but there are some spots that are better than others. If you're looking for water along the sandy beaches of salty desert lakes, dig a hole in the first depression behind the first sand dune. Stop digging when you hit wet sand. The first water is fresh, or nearly so, and is drinkable. If you dig deeper, you may strike salt water. If you find damp sand, dig a hole and wait for water to seep in. In other places, pick the lowest point between sand dunes and dig down 3 to 6 feet. If the sand becomes damp, keep digging until you hit water.

In a sand dune belt, search between the outermost dunes of the area rather than in the middle.

In stony desert country, look for dry stream beds. Dig at the lowest point on the outside of a bend in the stream channel.

In mud flats, during winter, you might find wet mud at the lowest point. Wring out mud in a piece of cloth to get water, but don't drink it if it's very salty or soapy tasting.

In some deserts you may be able to collect dew. Scoop out a hole, line the bottom with a piece of canvas, and fill the basin with pebbles taken from a foot or more under the surface. Dew might collect on the rocks and dribble and trickle onto the canvas. Collect the water early in the morning.

A land solar still, consisting of a 6-foot square transparent plastic sheet stretched over a hole in the ground, might help you obtain usable amounts of water. Figure 1 shows how to construct a solar still.

Medical Aspects

Overexposure to heat can be dangerous. It can cause three types of thermal stress; heat cramps, heat exhaustion, and heat stroke. The bright desert sunlight can also cause other significant problems.

Sunglare

The color of the ground varies a great deal in different deserts. In areas where there is light sand, as much as 80% of the light which falls on the ground is reflected back. That is nearly the same amount of reflection snow yields.

Snow blindness (photopthalmia) is caused by the reflection of short wavelength ultraviolet light. Since there is a higher percentage of ultraviolet light in equatorial regions, there is probably a damaging concentration of those light rays at eye level in some desert regions.

Solar retinitis (inflammation of the retina) produced by short infrared and invisible light rays can also occur in deserts. You won't be bothered by this, however, unless you look at the sun or are scanning the sky in the area immediately adjacent to the sun. The solution is simple, *wear your sunglasses.* Even though the glare doesn't seem painful, the very high light intensities of the desert will decrease your night vision.

If your sunglasses didn't survive the mishap, make some slit goggles from a piece of parachute harness and parachute cord or shade the eyes from above with a hat or turban which has cloth down the sides of your face. To cut down glare, smear charcoal or dirt on the bridge of your nose and below your eyes.

Sunblindness

Symptoms of sunblindness include: burning, watering, inflamed eyes; poor vision; a halo seen when looking at lights; and headaches.

The best way to treat sunblindness is to protect the eyes from light and relieve the pain. Stay in a day shelter or wear a lightproof bandage. Put damp compresses on the eyes. Take some aspirin if you have it. Do not use eye drops or ointments. Complete rest will help you recover in about 18 hours. Try to prevent the first attack. After the initial experience, you are more susceptible to subsequent attacks.

Food

In most deserts, animals are scarce. Their presence depends on water and vegetation, and there is little of either in the desert. Look for animals at water holes, in grassy canyons or low-lying areas, dry river beds where there is a greater chance of moisture, or under rocks and in bushes. Animals are most commonly seen at dusk or early morning. Sand grouse, ducks, buzzards, pelicans, and gulls have been seen over some desert lakes. Trap them in baited deadfalls or use a baited hook.

The most common desert animals are small rodents (rabbits, prairie dogs, rats), snakes, and lizards. They are generally found near brush or water and are your best and most reliable sources of food. Rodents may be caught by finding their burrows and catching the animals with loop snare, trap, or deadfall when they come out at dusk or dawn. Look for land snails on rocks and bushes.

Preserving Excess Foods

If you're lucky enough to kill a large animal, you can preserve it by wiping the raw meat dry with a cloth, cut it in arm-size strips, and burying it raw and uncovered, without salt, in dry sand 6-8 inches deep. Meat prepared this way will keep for at least three years and will resemble dried beef. Soak it in water to soften it and remove sand before cooking. Meat from young animals can be stored this way after the water is pressed out.

Plants

Locating water in all desert regions, whether torrid or frigid, is your primary concern. Ordinarily, whenever you find water in desert areas, plant food will also be available. But, when standing water is not available, your only choice will be to utilize any plants in the vicinity.

Many desert plants look very dry and unappetizing; start out by testing all the soft parts and digging to find the roots of trees and shrubs. Pull off the root bark. You may find some soft material that is edible, and water may drip from the cut root surface. Next, try all the soft parts above ground—flowers, fruits, seeds, young shoots, and bark. Thick, fleshy plants offer the best source of both food and water.

In the open desert during certain seasons, you may find some grass seed or bean bushes. These beans grow on trees or bushes known as Acacia trees which are often thorny and similar to mesquite or catclaw in the southwestern US. The beans are usually bitter, but prolonged soaking makes them edible.

The prickly pear (a kind of cactus), a native of North and South America, is now widely found in North Africa, the Near East, and in the Australian deserts. The fruits are edible.

Caution

Avoid all desert plants with milky juice. They may cause irritation to exposed skin surfaces. A white ooze running from a broken stem qualifies the plant as a "hands off" variety.

For the tenderest desert plants, search in places where ground water is close to the surface. The vegetation will appear greener, larger, or markedly different from surrounding types. Also search in dry river beds or other low areas. The damp sand in such places will support more abundant vegetation, and, you may possibly find some water a few feet below the surface.

Slow motion is better than speed in hot deserts. If you must move about in the heat, you'll last longer on less water if you take it easy. Remember, the desert dweller isn't *surviving* in the desert; he lives there and likes it. He isn't lazy—he's just living in slow motion, the way the desert *makes* him live. Don't fight the desert—you won't win.
(Editor's Note: For more on thermal stress see the article *No Sweat* in the May 1986 issue of *TMF.)*

Mishap With A Moral

A Door to Tragedy

Crew coordination, cockpit leadership, cockpit resource management, and situational awareness are all terms devoted to the same idea: using all the resources available to operate an airplane safely under normal and emergency conditions.

A Galaxy Airlines crew, flying a Lockheed Electra out of Reno-Cannon International Airport on 21 January 1985, had a chance to demonstrate that principle during an emergency immediately after takeoff. The ground crew left the air start access door on the right leading edge open. It proved to be a door to tragedy, as this omission presented the crew with an unfamiliar but controllable situation to which they responded unsuccessfully. The airplane crashed at 0104 Pacific Standard Time (PST) 1½ miles from the departure end and 3/4 mile to the right of the extended runway centerline of Runway 16R. The impact and subsequent fire killed the crew of 6 and 64 of the 65 passengers. The airplane was destroyed. The sky was clear and the visibility was 12 miles at the time of the mishap.

According to the National Transportation Safety Board (NTSB) investigation, on 21 January 1985, Galaxy Airlines Flight 203, a Lockheed Electra L-188C (N5532), was operating as a charter flight from Reno, Nevada, to Minneapolis, Minnesota. The crew began their duty period when they reported at about 1815 at the Seattle-Tacoma International Airport. The crew's scheduled departure time was 1530 but the Galaxy Airlines flight follower had informed them the flight would be delayed until about 2000 due to late arrival of N5532 on a previous flight. Witness testimony revealed the mishap crew's preflight consisted only of a manual fuel quantity check. The airplane departed Seattle at 2019 on a ferry flight to Oakland and arrived there at 2225.

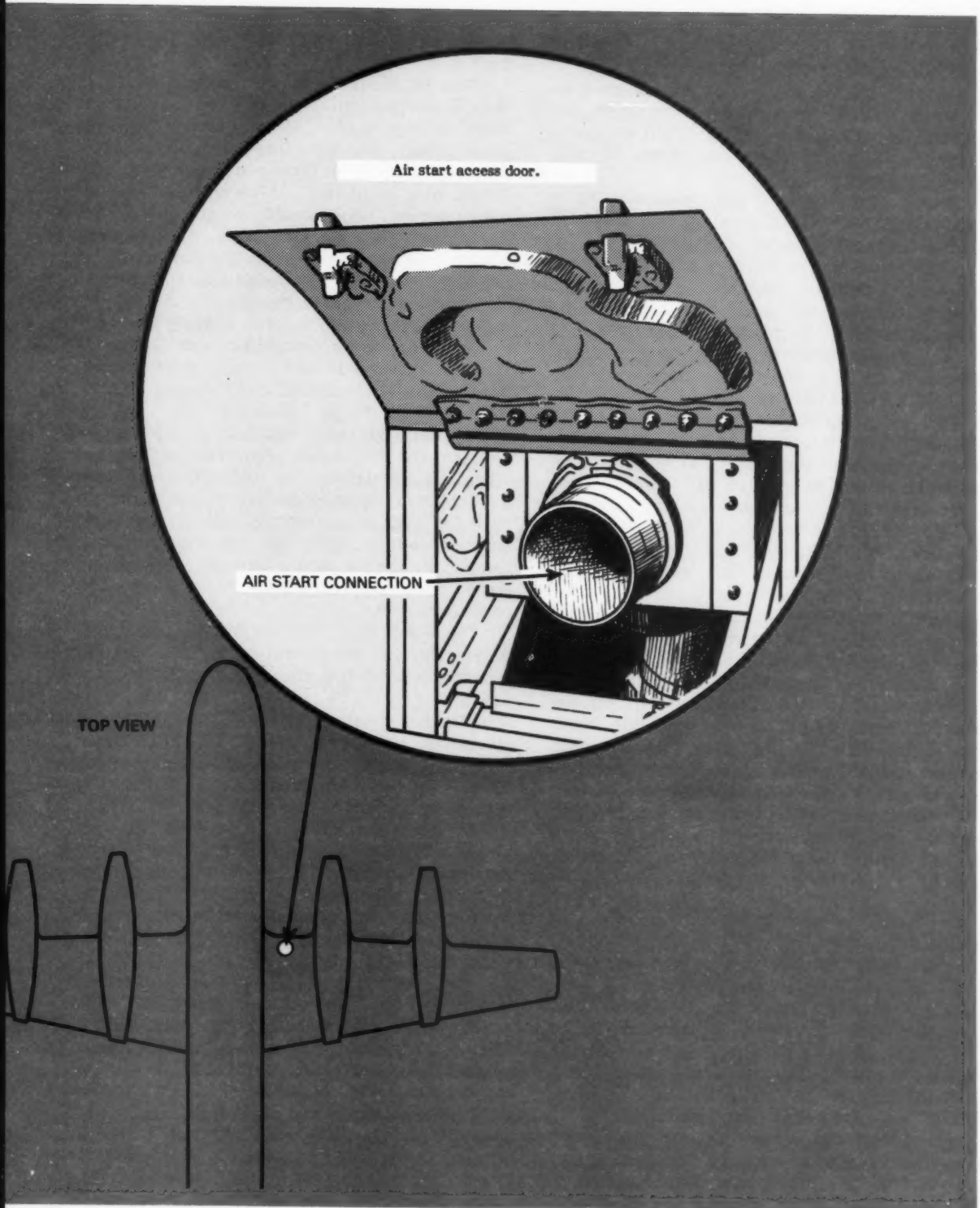
At Oakland, 65 passengers returning from the Super Bowl, boarded. During the stop at Oakland, a passenger visited the cockpit and spent about 20 minutes talking with the captain. The passenger noted that the crew appeared to be in a hurry. He remembered the captain had told him they (the crew) had to go to Minneapolis and be back in Seattle by seven o'clock on 21 January. The crew appeared to be rested. The passenger recalled nothing unusual about the flight.

The crew's apparent impatience evidenced itself in other ways at Reno. According to Cockpit Voice Recorder (CVR) tapes, checklist procedures were neglected as the captain did not respond to the flight engineer's checklist items. Ten checklist items were skipped and six others were called in incorrect order. Fourteen more items were not called out.

Following ground servicing, the ground handler supervisor signaled to the crew they could start engines. However, after engines 1 and 4 were started, he noticed the other ground handler was unable to disconnect the air start hose. It was stretched taut from the cart to the airplane's air start access panel, located on the underside of the right wing leading edge, close to the fillet area. He gave the flightcrew an emergency stop signal. He then left his position, disconnected the hose, and returned to his previous position. He testified he couldn't remember closing the air start door. The other ground handler picked up the hose, folded it into the air start cart, and pulled the cart away from the airplane.

The captain taxied with engines 1 and 4 running. Engines 2 and 3 were started about two minutes before the flight was cleared for takeoff. The CVR revealed power was advanced at 0102:44. Just 17 seconds later a sound similar to a glare shield rattle or nosewheel shake was recorded. Four seconds later, the captain said, "My yoke."

The first officer called "V-One" at 0103:19. Almost simultaneously a sound


Air start access door.
AIR START CONNECTION
TOP VIEW

characterized as a "thunk" was heard. He called "V-Two" four seconds later. This call was followed by another "thunk."

At 0103:26 the captain called for gear up. The first officer acknowledged the order. At 0103:29 the captain asked the flight engineer, "What is it, Mark?" He responded, "I don't know. I don't know, Al."

At 0103:37 the flight engineer said, "That's METO." (Maximum except takeoff engine power.) Three seconds later the captain ordered the flight engineer, "Okay, pull 'em back from METO." At 0103:43 the captain directed the first officer to request permission from the tower to execute a turn to a left downwind to return to the field. Two seconds later the first officer made the request. At 0103:50 the flight engineer said: "RPMs look stable, horsepowers look good." At 0103:55 the captain told the first officer to, "Tell 'em we have a heavy vibration." The first officer did so at 0103:58. Two seconds later the tower cleared Galaxy 203 to maintain VFR conditions and to enter a left downwind for Runway 16 right. The controller also asked, "Do you need the equipment?" Two seconds later, after the captain told him, "Yeah," the first officer responded, "That's affirmative." The Reno tower controller then asked Galaxy 203 for the number of people on board and fuel remaining. At 0104:13 the first officer replied, "Sixty-eight and we got full fuel." At 0104:14 the Ground Proximity Warning System (GPWS) sounded. At 0104:18 the first officer said, "A hundred knots." He repeated this three seconds later. At 0104:24 the captain called for maximum power. Six seconds later the CVR recorded sounds of impact.

Analysis

The Board found the flightcrew was properly certificated and qualified in accordance with applicable regulations for the non-scheduled, domestic, passenger flight. The flight attendants and local air traffic controller were also properly trained and qualified to perform their duties. Weather was not a factor in the accident.

The board studied all possible sources of the vibration and eventually focused attention on the air start access door. A former Lockheed Corporation official testified that an open air start access door could be the source of a heavy buffet similar to a stall buffet.

The evidence indicated *controllability* of N5532 was not compromised by the open air start access door. All systems, propellers, powerplants, and structural components were found without preexisting damage and were functioning at impact. Although the open air start access door would create vibrations, particularly at low airspeeds, the airplane could have been controlled and flown safely, had the flightcrew responded appropriately to the perceived emergency. The Board believed the crew's inappropriate response—reducing power below METO and failing to monitor airspeed and other performance parameters—led directly to the accident. The Safety Board believed the captain attempted, but was unable, to adequately perform the dual tasks of troubleshooting the vibration and flying the airplane. Not until 0104:24, six seconds before impact, did he call for full or maximum power. At that time, because of the prolonged power reduction, the airplane's altitude and airspeed deteriorated beyond the point of successful recovery.

The Board examined six factors that could have affected crewmember performance to determine *why* the crew took inappropriate actions.

- Airplane Vibration—It is likely the vibrations in N5532 masked the kinesthetic sensation associated with the stall buffet. This impeded the captain's ability to recognize the impending stall.
- Effects of Acute Stress—Piloting an aircraft during emergency conditions can be extremely stressful. Loss of control, failure to correctly perceive aircraft performance parameters, and misinterpretation of verbal communications can have fatal consequences. Hart and Bortolussi in their book *Human Factors*, found that in-flight errors committed by pilots may increase their workload, thereby causing subsequent errors. They theorized, "Whenever pilots slip, blunder, err, or even hesitate, additional workload may be created. First, the error must be recognized and identified. Next, the operator may be forced out of a well-learned, automatic sequence of action and required to exert additional effort to resolve the consequences of the error. Finally, the task

itself may change, so that additional tasks have to be performed as a consequence of the error."

N. A. Bond and others describe in *Aviation Psychology* the specific type of error that can occur during a stressful situation. They wrote, "Fixation of attention occurs when a pilot concentrates on one set of stimuli to the exclusion of others which also require his attention. It is most apt to occur when the pilot is emotionally aroused. Fascination of attention is similar to fixation. In this kind of failure, the pilot perceives all significant aspects of the situation but still fails to make the proper response."

The response to the emergency by the crewmembers of Galaxy 203 in general, and the captain in particular, showed their performance was adversely affected by stress. The captain's delay in recognizing deteriorating airspeed and aircraft performance, along with the first officer's preoccupation with ATC communications, demonstrates this. When the reduction in power failed to decrease the vibration, crewmember stress probably increased. Their ability to perceive the deterioration in airplane performance and develop alternative courses of action, particularly in the short time available for corrective action, decreased to the point where corrective action was no longer possible.

- Personality and Crew Coordination—The captain was described as "always in command." This characteristic of "being in command" may have been heightened by the composition of the crew. The first officer and flight engineer differed considerably from the captain in two important dimensions that affect interpersonal relationships in the cockpit: age and flight experience. The captain was over 20 years older than the junior crewmembers. The others had been operating the airplane for only a few months. Such diversity can contribute to deference by the junior crewmembers to the senior member, even under routine circumstances. Under the critical conditions experienced by Galaxy 203, flight experience should have been a valuable asset. Unfortunately, crew coordination broke down. After the onset of the vibrations, the captain took complete control of not only his actions but also those of the other crewmembers.

- Training and Experience—Despite their relative inexperience, the junior crewmembers *were* qualified in the Electra. They could have assisted the captain in monitoring the flight instruments and controlling the aircraft. Instead, they responded directly to the captain's commands; the first officer by communicating with the Reno tower, and the flight engineer by monitoring the engines. If the first officer had forcefully informed the captain of the deteriorating airspeed, it is possible power could have been applied in time to prevent the mishap.

Moreover, the first officer failed to place the more important duty of aircraft monitoring at a higher priority than responding to the controller's queries, albeit in accordance with the captain's direction. This demonstrated a failure to apply a critical tenet of flying: *aircraft control takes precedence over all other flight related duties.*

Probable Cause

The National Transportation Safety Board determined the probable cause of this accident was the captain's failure to control and the copilot's failure to monitor the flightpath and airspeed of the aircraft. This breakdown in crew coordination followed the onset of unexpected vibrations shortly after takeoff. Contributing to the mishap was the failure of ground handlers to properly close the air start access door, which led to the vibration.

Application to MAC

Every person responsible for servicing, operating, or directing aircraft shares in the safe outcome of that aircraft's operation. Get home-itis, sloppy procedures, breaks in habit patterns, blind obedience to directions, misplaced priorities, attention fixation, and overreliance on one crewmember all played a part in this mishap. Each of us must recognize the importance of our contributions to the mission. Crew coordination doesn't mean just reading the checklist in the proper order. It means taking responsibility, and sometimes taking direct action, to ensure the safety of the aircraft and the crew. This crew deteriorated into one overloaded pilot and two spectators.

Adapted from NTSB/AAR-86/01

THE MA

ROLL O

As of 30 Septe

MAC UNIT MISHAP-FREE
FLYING-HOUR MILESTONE AWARD

MAC U

750,000
76 MAS

600,000
1 MAS
6 MAS
14 MAS

500,000
63 MAW

460,000
3 MAS

450,000
4 MAS

400,000
86 MAS
137 TAW (ANG)

350,000
89 MAW

300,000
53 MAS
136 TAW (ANG)

250,000
11 AAS
62 MAW
445 MAW (Assoc)

220,000
9 MAS

200,000
11 AAS
315 MAW (Assoc)
403 RWRW (AFRES)
446 MAW (Assoc)
459 TAW (AFRES)
1400 MAS
1401 MAS

180,000
115 TAS (ANG)

150,000
15 MAS
36 TAS
436 MAW

140,000
54 WRS
55 WRS

120,000
1 HS
40 TAS
41 TAS
64 TAS (AFRES)
97 MAS (Assoc)
183 TAS (ANG)
313 MAS (Assoc)
185 TAS (ANG)
327 TAS (AFRES)

100,000
7 MAS
20 MAS
21 TAS
34 TATG
50 TAS
53 WRS
61 TAS
73 AAS
96 TAS (AFRES)
156 TAS (ANG)
180 TAS (ANG)
193 ECG (ANG)
312 MAS (Assoc)
316 TAG
345 TAS
349 MAW (Assoc)
374 TAW
439 TAW (AFRES)
514 MAW (Assoc)

30 YEARS OR M
1 MAS
64 TAS (AFRES)
73 AAS (Assoc)
76 MAS
312 MAS
327 TAS (AFRES)

25 THROUGH 2
1 HS
3 MAS
6 MAS
14 MAS
96 TAS (AFRES)
97 MAS (Assoc)
137 TAW (ANG)
156 TAS (ANG)
167 TAS (ANG)
180 TAS (ANG)
183 TAS (ANG)
185 TAS (ANG)
187 TAS (ANG)
193 ECG (ANG
301 ARRS (AFRES)
303 TAS (AFRES)
305 ARRS (AFRES)
313 MAS (Assoc)

20 THROUGH
Det 11, 39 ARRW
Det 5, 40 ARRS
Det 18, 40 ARRS

AC Flyer

OF HONOR

September 1986

UNIT MISHAP—FREE FLYING-YEAR MILESTONE AWARD

R MORE

48 ARRS
53 MAS
54 WRS
55 ARRS
55 WRS
58 MAS
63 TAS (AFRES)
95 TAS (AFRES)
115 TAS (ANG)
130 TAS (ANG)
142 TAS (ANG)
144 TAS (ANG)
328 TAS (AFRES)
403 RWRW (AFRES)
459 TAW (AFRES)
728 MAS (Assoc)
756 TAS (AFRES)
758 TAS (AFRES)

H 29 YEARS

10 THROUGH 19 YEARS

4 MAS
7 SOS
8 SOS
9 MAS
11 AAS
21 TAS
31 ARRS
36 TAS
Det 2, 37 ARRS
Det 3, 37 ARRS
Det 5, 37 ARRS
Det 6, 37 ARRS
Det 8, 37 ARRS
Det 9, 37 ARRS

GH 24 YEARS

Det 5, 39 ARRW
Det 4, 40 ARRS
Det 6, 40 ARRS
Det 22, 40 ARRS
40 TAS
41 TAS
50 TAS
53 WRS
55 AAS
56 MAS
61 TAS
Det 9, 67 ARRS
68 MAS (AFRES)
86 MAS
Det 1, 89 MAW
94 TAW (AFRES)
109 TAS (ANG)
129 ARRS (ANG)
133 TAW (ANG)
135 TAS (ANG)
136 TAW (ANG)
139 TAS (ANG)
143 TAS (ANG)
146 TAW (ANG)
155 TAS (ANG)
158 TAS (ANG)
164 TAS (ANG)
181 TAS (ANG)
300 MAS (Assoc)
301 MAS (Assoc)
302 SOS (AFRES)
304 ARRS (AFRES)
315 MAW (Assoc)
316 TAG
326 MAS (Assoc)
335 MAS (Assoc)
337 TAS (AFRES)
345 TAS
356 TAS (AFRES)
357 TAS (AFRES)
439 TAW (AFRES)
445 MAW (Assoc)
446 MAW (Assoc)
512 MAW (Assoc)
700 TAS (AFRES)
701 MAS (Assoc)
707 MAS (Assoc)
708 MAS (Assoc)
709 MAS (Assoc)
711 SOS (AFRES)
729 MAS (Assoc)
730 MAS (Assoc)
732 MAS (Assoc)
815 WRS (AFRES)
932 AAG (Assoc)
1400 MAS
Det 1, 1400 MAS
Det 2, 1400 MAS
Det 3, 1400 MAS
Det 4, 1400 MAS
Det 1, 1401 MAS
Det 2, 1401 MAS
Det 3, 1401 MAS
Det 4, 1401 MAS
Det 2, 1402 MAS
Det 3, 1402 MAS
Det 4, 1402 MAS

Excellence in Airmanship

The crew of Air Force Rescue 819: (front row, left to right) 1Lt Gary T. Ambarian, Navigator, 1Lt Thomas M. Buckner, Copilot, 1Lt Alan G. Sherman, Aircraft Commander, (back row, left to right) TSgt Robert L. Holler, Pararescueman, TSgt Jimmy James, Jr., Loadmaster, SSgt Douglas J. Leach, Communications Specialist, and MSgt John F. Lozanski, Flight Engineer. Not pictured is SSgt Rick Smith, Pararescueman, whose wife was having a baby the day the picture was taken.
Photo of Major Kenneth C. Johnson, Jr., and crew unavailable.

Information Provided by: Todd Frueling Capt. HQ/AFRES Public Affairs.

Maj. Kenneth C. Johnson, Jr., and crew, 301 ARRS, Homestead AFB, FL., and 1st Lt. Al Sherman and crew, 55 ARRS, Eglin AFB, FL., performed an extraordinary feat of airmanship during a life-saving rescue mission. On 10 Feb 86, Major Johnson, an HH-3E aircraft commander, received a medical evacuation request. A 21-year-old sailor was suffering from a stab wound in the chest. His ship, the Panamanian freighter *Cambridge*, was about 400 nm east/northeast of Miami. To help fly the extensive distance, Major Johnson was assisted by two other pilots, Maj. Frank Waid and Capt. Van J. Leffler. However, the most readily available HC-130 air refueling tanker support was from the 55 ARRS. Even though the faster tanker was to catch up to the helicopter, Major Johnson needed to postpone his own takeoff for two-and-one-half hours.

Lieutenant Sherman, aircraft commander of the HC-130, took off on time. The crew used direction finding (DF) equipment and air-to-air TACAN in place of their malfunctioning radar to find and join up with the HH-3E and completed an aerial refueling at 12:20 PM, while enroute to the freighter. The helicopter got to the ship one hour later. Two pararescuemen (PJs) were lowered onto the *Cambridge* and Major Johnson's crew prepared for the pickup—the first pickup, that is.

Just before arriving on scene, the tanker, orbiting overhead, relayed a radio message to the helicopter of another injured sailor further out at sea. The tanker had just enough fuel for itself and the helicopter to complete the second rescue and return home.

It took half-an-hour to recover the two PJs and the stabbing victim. At 2:10 PM, the tanker and helicopter went on to the next rescue mission. The second ship, the *Cape Florida*, a research vessel for the University of Miami, had a seaman with a severe head injury. The ship was 120 miles northeast of the *Cambridge's* position, and further out to sea.

After the first rescue, the helicopter's hoist broke. The cable didn't wind up properly on the drum. The whole crew knew that without the hoist, the PJs would have to go into the water and slowly drag their patient in a rubber boat to the helicopter hovering just inches above the ocean.

After a second air refueling at 2:20 PM, the helicopter arrived at the *Cape Florida* an hour after the first rescue.

"Through relays with the tanker circling

overhead," Major Johnson said, "we were in radio contact with our rescue operations throughout the mission. Since the ship had a small motorized rubber boat to bring the injured sailor to us, we advised rescue operations that we could still pick up the sailor using a low hover. The waves weren't too large, only two feet or so, and we had enough crewmembers to physically lift him into the helicopter. Rescue operations approved our plan, and we started the pickup."

Major Johnson made a low approach, hovering just a few feet above the water, as close to the ship as possible. However, 30 minutes and two attempts later, the patient was still in the small rubber boat, pushed away by the strong wind from the helicopter's rotor blades. Suddenly the helicopter shuddered.

As a safety precaution, Major Johnson immediately climbed 10 feet. The helicopter shuddered again, so he continued the climb and at 300 feet above water there was a loud bang and the instruments finally told their story. The number-2 engine had experienced a compressor stall followed by a complete power loss. The number-1 engine was also damaged and badly overheating, mustering only 85% power. This power loss caused the aircraft to descend to 25 feet above water level. Major Johnson was forced to break off the second rescue before the remaining engine failed . . . or the helicopter ran out of fuel.

Still circling overhead the tanker commanded by Lieutenant Al Sherman gave navigation assistance, guiding the helicopter toward Marsh Harbor Airport in the Bahamas, 250 miles west.

The helicopter needed more fuel and had to gain altitude to safely do the refueling. About 250 lbs of extra equipment was thrown overboard to help the helicopter climb higher and allow for the extra fuel. It took 30 minutes to climb to 800 feet. Maximum speed was only 70 knots—50 knots below normal. They flew another 20 minutes to further lighten the fuel load and slowly climbed to 1,200 feet. The helicopter ended up flying on one engine at its peak operating temperature for 45 minutes before Major Johnson and Lieutenant Sherman felt they could safely attempt an air refueling.

"Refueling on one engine was a real trick, since we were flying much slower than the tanker's normal minimum operating speed," said Major Johnson. "Usually, with two engines, we refuel at 110 knots. The tanker passes about 200 feet beneath us, matching our speed. With the extra power from both engines, we can stay with the tanker," he continued.

"One engine was out and the other produced only 85% power," according to Major Johnson. "We could get no more than 90 knots in the shallow refueling dive, and I didn't know how long we could hold that speed, either. I just hoped that with his own reduced fuel load, the tanker could slow down enough so we could stay with them. Once we lost altitude, we didn't have enough power to climb again, and we were only at 1,200 feet to begin with," he said.

"Lieutenant Sherman brought his tanker beneath us and we connected with his refueling hose on the very first pass," Major Johnson added.

"By drafting the tanker, staying within 5-10 feet of its wing, I was able to keep my speed up without straining the engine, taking fuel only when I needed it. We stayed hooked up to the tanker for the remainder of the flight, never having more than 500 pounds of fuel (less than 100 gallons) in the helicopter," he said.

"We flew for 2 hours and 50 minutes in that tight formation to the Marsh Harbor Airport. Lieutenant Sherman and his crew really worked their tanker to keep their speed down for us, and they stayed at that reduced speed for the whole trip back. It was a tremendously skillful piece of flying," he continued.

Finally, the helicopter landed at the airport at 7:50 PM after an exhausting 10-hour mission. The first accident victim, now in a very serious condition, was transferred to a Coast Guard helicopter and taken to the nearest hospital. It was still another hour's flight away, but he made it safely and recovered from his injuries. Lieutenant Sherman had to fly on to Homestead AFB.

Meanwhile, the PJs and the second accident victim spent the night on the Cape Florida. They were picked up the next day by a second helicopter from the 301 ARRS. The second victim also recovered. The TMF staffs extends its congratulations for a job very well done.

Flying-Hour Milestones

CMSgt David H. Frazier, 167 TAG

MSgt Albert J. Ryan, Jr., 167 TAG

Lt Col George R. Hittle, 910 TAG
MSgt Charles J. Fiore, 702 MAS

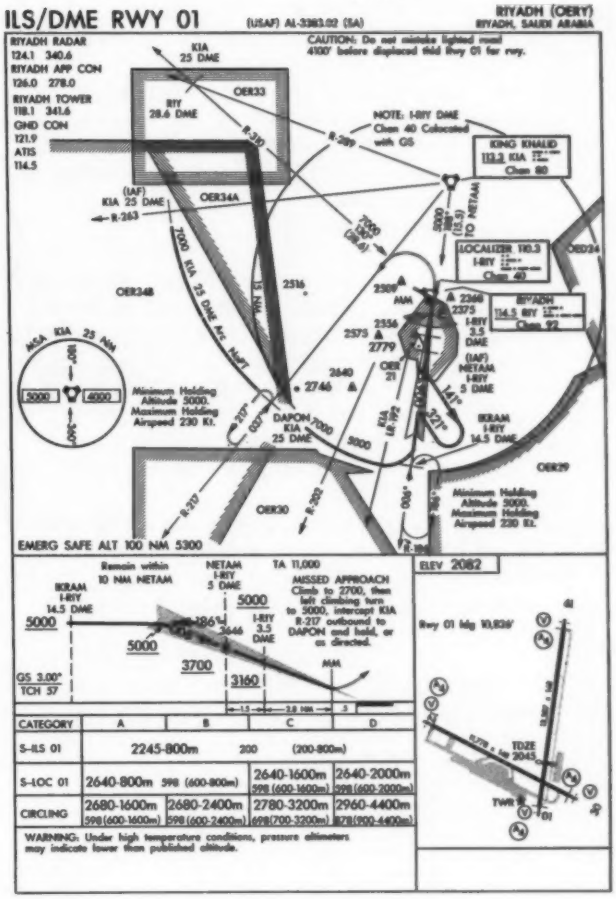
Col John Harvey, 910 TAG/CC
Lt Col Frederick M. Ashmore, 1402 MAS
Lt Col Bruce J. Benzie, 167 TAG
Lt Col Francis V. Jones, 15 MAS
Lt Col Robert W. Lambert, 3 MAS
Lt Col William Moss, 757 TAS
Lt Col Lyle A. Sproul, 58 MAS
Lt Col Hoyle B. Williams, 357 TAS
Maj David B. Andersen, 702 MAS
Maj William E. Cook, 185 TAS
Maj James B. Crawford, III., 167 TAG
Maj Thomas Doering, 757 TAS
Maj Albert J. Durning, 55 AAS
Maj Jerry Froemming, 757 TAS
Maj Stephen A. Kecskes, 58 MAS
Maj James Repucci, 910 TAG
Maj Simon H. Rudnick, 15 MAS
Maj Franklin C. Schmeer, 702 MAS
Maj Martin P. Sedlacko, 702 MAS
Maj David B. Strider, 167 TAG
Maj Robert D. Usiak, 702 MAS
Capt Stephen L. Avery, 707 MAS
Capt Steven Kraysets, 757 TAS
Capt Norman B. Lefevre, 10 MAS
Capt Lloyd J. Maraist, 3 MAS
Capt David J. McCarthy, 702 MAS
Capt John W. Mueller, 41 ARRS
MSgt Walter L. Arnold, 62 TAS
MSgt Dennis Bowling, 20 SOS
MSgt Kyren C. Dooley, 702 MAS
MSgt Jerry F. Gilgore, 183 TAS
MSgt Roger D. Gill, 304 ARRS
MSgt Richard B. Hasley, 757 TAS
MSgt Russell E. Martin, 304 ARRS
MSgt Robert L. Riales, 155 TAS
MSgt Michael J. Sandor, 757 TAS
MSgt Gerald E. Staiger, 702 MAS
TSgt Kim I. McAllister, 3 MAS
Sgt Gary A. Ask, 375 CAMS

MSgt John C. Repper, 1551 FTS
TSgt Jay B. Huff, Jr., 21 TAS
TSgt Nelson Neal, 20 SOS
TSgt Walter E. Salley, II., 6 MAS

Ranks and units are those at time of award. See MACR 900-3 for details on how to apply for your own milestone award.

TMF Instrument Quiz

You're off to Saudi Arabia. Land of sun, heat, and *lots* of beach. As part of your normal preflight, an in-depth study of your destination's (Riyadh) approach plate is in order. The forecast winds favor Rwy 01 and the expected temperature is a hot 48°C (118.4°F).



1. The Riyadh airport elevation is:
   a. 2,640 feet.
   b. 2,245 meters.
   c. 2,082 feet.
   d. 2,082 cubits.

2. When filing, your IAF will be:
   a. DAPON.
   b. NETAM.
   c. KIA 263/025 DME.
   d. b or c.

3. Approaching Riyadh from the northeast, the minimum safe altitude sector altitude of _____ will provide _____ of obstruction clearance within _____ of _____.
   a. 4,000 feet; 1,000 feet; 100 nm, the field.
   b. 4,000 feet; 1,000 feet; 25 nm, RIY VORTAC.
   c. 5,300 feet; 1,000 feet; 25 nm, NETAM.
   d. 4,000 feet; 1,000 feet; 25 nm; KIA VORTAC.

4. During the procedure turn, you must remain within 10 nm of:
   a. RIY VORTAC.
   b. NETAM.
   c. IKRAM.
   d. the middle marker.

5. During the approach, you may descend to 3,700 feet when:

a. you pass NETAM inbound.

b. you are established on the localizer inbound.

c. during the procedure turn.

d. when instructed by the controller.

6. Well, you're there. The glideslope is out but this will be a no-sweat approach and the day will be over. After you complete the procedure turn and are inbound to NETAM on the localizer, you spot the airport through the haze as it slips by under the airplane before you even reach 3,700 feet. What gives?

a. You've just entered The Twilight Zone.

b. An anomaly in the earth's magnetic field is obviously affecting your NAVAIDS.

c. Tuning to I-RIY Channel 40, which is co-located with the glideslope, might have been a good idea.

d. You goofed.

7. After profuse apologies to the controller, you're on short final on your next approach when you see lights coming toward you on the runway. You do another missed approach and testily question the controller, "What was that?" Select his most likely response.

a. "Sorry sir, it was the ops truck checking out a report of a disabled camel on the runway."

b. "You ninny, you mistook the lighted road 4,100 feet before the displaced threshold of RWY 01 for the runway. Take a closer look at the approach next time."

8. You have been instructed to circle to land on Rwy 30. If your planned maneuvering speed is 152 knots, your circling approach minimums are:

a. 2,680 feet-1,600 meters.

b. 2,960 feet-4,400 meters.

c. 2,680 feet-2,400 meters.

d. 2,780 feet-3,200 meters.

9. During your circle, the controller directs you to go around again and proceed to DAPON and hold. The holding pattern at DAPON is:

a. standard

b. non-standard

10. Well, you're finally on the ground. However, your airplane is equipped with the new, guaranteed error-free M1A1 MARK XXVII altimeter and you notice it indicates below field elevation. You should:

a. adjust the setting to indicate proper field elevation.

b. apply for a refund of the government's money.

c. kick it.

d. read the WARNING on the approach plate stating that under high temperatures conditions, pressure altimeters may indicate lower than published altitudes.

ANSWERS

1. c. The airport elevation is found in the upper left hand corner of the airport diagram on the approach plate.
2. d. Both NETAM and the KIA 263/025 DME fix are designated as Initial Approach Fixes.
3. d. The 4,000-foot sector altitude will provide 1,000-foot obstacle clearance within 25 NM of the depicted facility, in this case, KIA VORTAC.
4. b. This is spelled out on the profile view.
5. b.
6. c&d. This time reading the CAUTION at the top of the planview would have saved the day (and some gas).
7. b. The NOTE on the planview spells this out loud and clear.
8. b. An approach speed of 152 knots puts you in Category D.
9. b. A standard holding pattern uses right turns.
10. d.

So, You're a Safety Investigation Board President

HQ MAC Flight Safety Division sponsors a classroom for colonels.

The last 25 days were the most miserable ones in Col. Hardesty Steele's career. Ever since he was selected as the Safety Investigation Board President investigating the C-141 mishap, everything seemed to have gone downhill. It was bad enough the mishap occurred, but it occurred in a remote location in the Pacific Northwest which really complicated matters.

The lack of billeting, communications, messing facilities, and transportation were administrative difficulties he had to deal with that consumed far too much of his time during the first two weeks of the investigation. He and other board members couldn't seem to agree on the reason this aircraft lay, still-smoldering in the Oregon backwoods. Search and rescue personnel did a superb job in recovering survivors, but the remains of those who perished were still not all accounted for.

Even though the mishap site was not easily accessible, the local news station's helicopter (complete with cameraman and one each, upcoming, investigative reporter) seemed to have little difficulty locating the crash site. Their reports aired nightly at 6 and 11 PM. Though the colonel hated to admit it, his down-home-type interviews were making him and the Air Force look inept; not to mention his inadvertent disclosure of some privileged information. During one of his trips back to the local air force base, he heard rumors that the CINC was wondering what was going on with the investigation proceedings. To top everything else off, Colonel Steele hadn't even *begun* to develop the mishap briefing—and he had only five days left. . . .

This fictitious account reveals only a few of the potential problems faced by those individuals selected as a safety board president following a Class A or B mishap. To prevent many of these problems and help prospective board presidents determine causes and make recommendations to avoid recurrence of similar mishaps, the Military Airlift Command Inspector General (MAC/IG) instituted the MAC Safety Investigation Board Presidents' Course.

Graduates of the 1986 MAC Safety Investigation Board President's Course. Front row, left to right: Col. Daniel Sowada, Col. Douglas Senter, Col. John Rogers, Col. John Villanueva, Col. Roland Page, Col. James Johnson, Col. James McArdle, Jr. Back row: Col. Merwin Horner, Jr., Col. Rodney Wells, Col. James Galyen, Col. Frank Van Cura, Col. William Whitaker, III, Col. Donald DeLaney, Col. Paul Renfro, Col. Charles Wingert, Col. Howard Epstein.

Formerly, initial training of safety board presidents was offered on an optional basis by the Air Force Inspection and Safety Center (AFISC) at Norton AFB, California. Recently, however, the course was dropped by AFISC. This opened the door for the major air commands to establish their own, command-oriented board presidents' course—and MAC led the way.

The course was developed by the MAC/IG Flight Safety Division and the first class was held 6 through 8 May 1986 at Scott AFB, Illinois. Fifteen colonels from MAC and Air Force Communications Command (AFCC), along with observers from Strategic Air Command (SAC), participated. The SAC observers are in the process of developing a similar program.

The MAC, 3-day course, teaches future board presidents to organize and manage the mishap investigation including preparation of written reports and the mishap briefing. The ultimate goal of any mishap board is to prevent similar flight mishaps.

Twelve-Star Importance

Col. Richard W. Blatter, HQ MAC Director of Safety, opened the course with comments regarding the goals of the program. Brig. Gen. William H. Sistrunk,

MAC Inspector General, impressed upon the group that a mishap board president is the personal representative of CINCMAC. As such, he or she is vested with the authority and the responsibility to take whatever steps are necessary to discover the cause (or causes) of the mishap and recommend actions to prevent similar mishaps.

Maj. Gen. Anthony J. Burshnick, HQ MAC Deputy Chief of Staff for Plans, discussed the proper use of, and procedures for, implementing aircraft modifications for accident prevention. Likewise, Maj. Gen. Donald A. Logeais, HQ MAC Deputy Chief of Staff for Logistics, briefed the need for board presidents to identify, early in the mishap investigation, materiel failures or maintenance practices which might prove to be factors involved. General Logeais indicated that his staff would take immediate action to correct such failures or practices regardless whether they were based on final or interim recommendations. Maj. Gen. William E. Overacker, HQ MAC Deputy Chief of Staff for Operations, focused attention on the human factors involved in the majority of MAC flight mishaps over the past several years. He noted the responsibilities of crewmembers and supervisors alike in mishap prevention.

Brig. Gen. Paul A. Harvey, HQ MAC Chief of Staff, at a dinner for the participants, commented on the need for in-depth analysis of all aspects of a mishap and said safety board presidents shouldn't hesitate to make use of the MAC Staff, particularly the IG Staff.

General Duane H. Cassidy, Commander in Chief, Military Airlift Command, discussed the role supervision plays in nearly every flight mishap. General Cassidy cautioned the prospective board presidents not to push themselves (or allow themselves to get pushed) into early decisions regarding mishap causes based on circumstantial evidence.

The Nuts and Bolts

Enhancing this "Big Picture" approach to mishap investigations, the HQ MAC Flight Safety Division provided those attending with the information and basic skills necessary to successfully manage a mishap investigation. This included some experience-tested organizational strategies along with interview techniques, tips for writing findings and recommendations, advice on briefing preparation, and the proper care and use of privileged information. Officers from HQ MAC Public Affairs detailed the intricacies of how best to deal with the civilian news media during a mishap investigation.

Col. Ralph Hathaway, Director of Aeromedical Services, USAF Medical Center, Scott AFB, Illinois, briefed the proper role of the medical board member during the investigation. His presentation included a real-life portrayal of the duties he was responsible for as the medical board member on a recent mishap.

Lt. Col. Robert Sherman, Chief of Aerospace Physiology, USAF Hospital, Little Rock AFB, Arkansas, provided information regarding human factors involved in mishaps. His point was that as a board president, it is sometimes easy to get caught up in the technical aspects of the investigation and overlook the less-obvious impact of human factors.

Experience is the Best Teacher

The highlight of the course was the Board Presidents' Seminar. The seminar offered attendees the opportunity to discuss the problems associated with investigating a mishap with four former mishap investigation board presidents: Col. Charles Barnhill, Jr., Col. Edward Brya, Col. Robert Lovretich, and Col. Robin Purdie. Each of these officers delivered a brief synopsis of the mishap he investigated, followed by a description of problem areas along with the things that helped guarantee the success of their board. Colonel Brya also presented the mishap briefing he'd presented to CINCMAC. Colonel Brya's presentation was a superb example of a well prepared mishap briefing.

HQ MAC Flight Safety Division will conduct the Safety Investigation Board President's Course annually to ensure sufficient trained colonels are available. The Command interest the course generates, along with the technical information presented, and personal experiences of others guarantees the success of this course. All attendees expressed appreciation for the course and stated it would undoubtedly help them manage a thorough and successful investigation if called upon to do so.

Another Heavy Equipment Drop

Brought to you by CLM.

"Hello, Jack. Are you flying the mission with us tonight?"

"Sure am, Mac. I've got three day heavy drops and two night low-level routes to finish, then I'm done."

"Shouldn't be too much trouble, Jack. Looks like the worst of the weather will be past us by takeoff time. What was it you figured, about four minutes early to meet our first TOA?"

"Right. Well Bill, what guidance emanates from on high?"

"Give 'em a break, Jack. Those command post guys are going at break-neck speed, what with the weather, last minute tail swaps, and all the through traffic. I sure don't envy them any."

"I guess you're right," Jack conceded.

"Mac, let's get the weather update and get out of here." Bill seemed anxious to get started.

"Sounds good to me, Bill. Hello there, Sgt. Harris, still prognosticating I see. We're Bondo 61, with an 1800, er, a 1756 local takeoff time, headed for Blind DZ. How does it look out there?"

"Well, sir, seems the weather is moving slower than we anticipated. For takeoff you'll have a wet runway, and the thunderstorms will still be in the area, though slowly moving north. The winds and the rest of the briefing remain pretty much the same. You're not part of the six-ship?"

"No. They'll be in a little later. Thanks for the words, and we'll see you in about five hours. C'mon Jack. No fun flying only in the sunshine." Mac grabbed his helmet bag and headed for the waiting crew transport.

Engine start, taxi, takeoff, and the first part of the route were not unlike any other low-level mission; even the weather was cooperating. They entered the mountains about 20 minutes later.

"Navigator, Pilot. What's our time and status?"

"We're coming up on the 10-minute warning," Jack replied. "A quick weather check for you. I'm painting a band of precip beginning some 30° off our nose to the right at about 25 nm, stretching to the right. I'll keep you posted." Jack didn't appear too concerned. The 10-minute warning and route continued uneventfully.

"Jack, it is *really* rough out here. Do you think it'd smooth out if we climbed to 2,000 at this next checkpoint?" Bill was concerned; this was, after all, a training mission, and the weather briefing, while not specifically forecasting severe turbulence, predicted conditions which could certainly produce mountain waves.

"I'll second that, Copilot," Mac jested. "I've just fed my left leg its third cup of coffee. Go ahead and contact ATC with our request. Jack, is there any reason we shouldn't climb?"

"None that I know of, Mac. The frequencies are 121.6 or 243.8, Co."

"Thanks, Nav," Bill began working with the radios. "I'll let 'em know we'll be continuing as per our flight plan, except the

altitude, Pilot."

"Pilot, Loadmaster. Are we aborting this drop? My student really needs this actual to finish his training. This makes our fourth try at dropping this week."

"Loadmaster, Navigator. We're just going to try to find some smoother air."

"Pilot, Copilot. ATC says unable until point Tango."

"Nav . . . ."

"That's about 11 miles ahead of us, just before we turn due north." Jack was ready for that. "It'd sure be easier if we always used the same terminology."

"Yeah, but somehow I doubt the controller can keep track of which bend in the river is which," Bill threw in.

"That makes sense, and we'd have trouble working with all letters enroute. Oh well. You guys see that craggy hill at our 1:30 for three miles?"

"Yeah. I got it," Mac responded first, "how about you, Bill? The one with the sheer face towards us."

"Yes, I see it."

"Okay, Pilot," Jack began the familiar turn point ritual, "just offset us about 1½ miles to the left and we ought to fly right over a river "Y," which is our actual turn point. We'll come right then to a heading of 359°, the leg's 14 nm long and our revised altitude clearance calls for a climb *after* the turn to 2,000. This is point Tango."

"Roger, Navigator. I'm picking up the river now," Bill began, "I'll give you a hack abeam the hill, unless I see the "Y" first. Ready . . . Ready . . . Ready . . . Ready . . . *Hack*"

"Thanks, Copilot. But, uh, is that the Air Force standard and approved number of 'readys' per hack?"

"Sorry 'bout that, Nav. I picked out the 'Y' at the last second."

"No sweat, Bill. One thousand to go, Pilot."

"Thanks, Nav. How's the weather looking?"

"I think the weather's not going to be too much trouble," Jack answered. The mission continued at 2,000 ft, considerably smoother for the altitude.

"Pilot, Navigator, 30 seconds to slowdown . . . Slow down now." Jack's warnings initiated the descending slowdown and appropriate checklists.

"Okay," Bill began, "the DZ is at our 2:30 for 11 miles, a big dirt clearing in the trees. We'll stay on this heading for another two miles, then come left back to centerline. The drift should be from the right, so we'll want to be a little right."

"Navigator, Engineer, waiting on the one-minute."

"Pilot, Nav. Come left to 355°."

"Turning, it looks like we'll be in some rain on the run-in. Co, are we still in contact with the DZ?"

"Turn back right to 357°, Pilot. We're five miles out, crossing centerline now. Drift is five left, and if you've no objections, I'll leave the course guidance to you while I recalculate the CARP."

"Okay, I'll hold this heading," Mac said. "We're beginning to pick up some rain here."

"Should be coming out of it soon," Jack assured.

"Okay, Pilot, the new CARP puts us 150 yards right of centerline, the five second . . .

"Copilot, Engineer. ATC is calling on Victor. Something about a weather warning or something."

"Thanks, Eng. I'll get it," Bill answered.

CRACK!

"Pilot, Copilot. We've hit a bird. And a big one at that. My lower side window is shattered, and judging from the sudden cold, I think both panes took it in."

"Pilot, Engineer. We've got a master prop low oil light. Let's see, it's on number-3, the light is steady."

"Pilot, Nav. We need about another 50 yards right, drift is 3 right and I've got us descending slowly."

"Pilot, ATC is asking for our ETA back into their airspace, we've got some conflicting traffic, apparently headed for the private parachute area adjacent to the . . ."

"Crew, Pilot. Let's slow down here," Mac interrupted. "This will be a no drop. Acknowledge."

"No drop acknowledged, Copilot."

"No drop acknowledged, Loadmaster."

"Copilot, feather number-3 engine."

"Number-3 condition lever to feather," Bill responded. "Thumbs up, Eng?"

"Roger, sir."

"Copilot, talk to ATC. Tell them we've shut down number-3 and we're climbing now, headed south. Then work with the engineer on our other problems," Mac continued. "Engineer, run the clean-up checklist. Loadmaster, button up the back and get strapped in. Let the engineer know when you're ready, I'll hold acceleration 'til then. Navigator, record all the pertinent information about our location and so forth for the birdstrike, I'm turning due south for now, climbing to 7,500 VFR, how's that check?"

"Heading and altitude are good, Pilot."

"Engineer, Loadmaster. We're all buttoned up and strapped in back here."

"Thanks, Load. Pilot, Engineer. Cleanup checklist is complete."

"Thanks, Engineer," Mac acknowledged. "Navigator, while the copilot's on Uniform, take Victor and call the DZ. Tell 'em we're done for today. Crew, I'm accelerating now."

"Pilot, we're cleared to 10,000 feet, direct home," Bill interjected. "They want to know if we're an emergency."

"We sure are. Nav, we'll need an ETA home."

"Roger, Pilot. ETA is 1903," Jack said, the DZCO is aware of our status. If you'll set in command post, I'll let 'em know we're coming."

"You've got it," Bill answered for Mac.

A few seconds later, Jack had the response from home. "Command post said to park in hard stand 22 if we can, the DO will meet us in parking."

"Crew, Pilot. Thanks, that was a good job." Mac was relieved.

"You too, Pilot, nice flying," responded Bill.

"What I know is this crew has six active, working crewmembers. One of the easiest things to do is fly the airplane while the rest of the crew deals with problems. Especially when they arise nearly simultaneously," Mac said.

"Sure, Mac. But there were so many things happening at once, it would've been pretty easy to get sidetracked," Bill pointed out.

"That's something you'll see more and more of as an AC, Bill. If the crew is performing well, all you need do is coordinate the effort. It's fairly easy really, but as you mentioned, more than one mishap has resulted from pilot distraction, inattention, or selective disattention. But that's another story. Now let's see how well the ILS is working tonight."

Quick Stoppers

Bird KOs Radome

After departing their European stopover base, this Starlifter was climbing through 3,000 feet MSL and the crew was just getting settled in for their transatlantic flight. Suddenly they heard a loud "bang." Airspeed at the time of the mysterious explosion was 157 KIAS. However, no unusual indications were observed in the cockpit and the crew continued the departure. A sudden increase in the noise level began as the aircraft passed through 13,000 ft MSL. Approximately one minute after the noise started, the pilots noticed a 30 KIAS difference between their airspeed indicators. The AC declared an emergency and returned the aircraft to the departure base. Because both airspeed indicators were deemed unreliable, the pilots referenced INS groundspeed while flying the approach and landed uneventfully. After landing, inspectors found the gruesome remains of a large bird which attempted (successfully) to become one with their radome. Aircraft damage included a destroyed radome, a damaged radar antenna, a damaged number-two engine ring cowl, and a gash in the left gear pod.

The -4° Celcius Blues

The crew of this C-12 rediscovered what weather forecasters have said for years—aircraft are more likely to encounter lightning while flying through visible precipitation when OAT is between +8°C and -8°C. This aircraft was descending through 15,000 feet when both pilots observed a bright flash in the vicinity of the left propeller. The pilots suspected a lightning strike and immediately began checking for system malfunctions. None were discovered and the aircraft landed uneventfully.

Postflight inspection of the aircraft revealed lightning damage to a left engine propeller blade, the left outboard flap panel, and the left elevator. The mishap investigator verified weather associated with frontal passage was present at the time of the mishap but no thunderstorm activity was forecast, reported, or observed on radar. Weather conditions at the time of the mishap included light snow and light icing. Outside air temperature was -4°C.

Which Way Did It Go???

The pilot of the helicopter had just increased airspeed after takeoff when, without warning, his sliding window suddenly departed the aircraft. At the time of the mishap, both windows were about halfway open and the aft cargo ramp was down. After departure of said errant window, the pilot slowed his craft to 70 KIAS, circled, but was unable to locate the missing window. The pilot then elected to accom-plish a precautionary landing at a nearby civilian airport to assess any aircraft damage caused by the falling window—there was none. The crew removed the window frame and returned to home base. The cause of this incident is still under investigation.

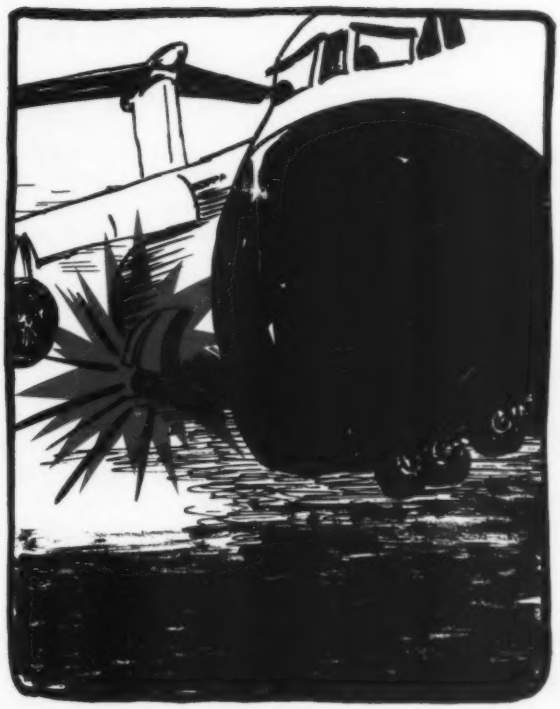
Don't Kneel Too Soon

CAUTION

When parking the airplane (C-5) for kneeling, *all* landing gear *must* be centered and the airplane taxied straight ahead a few feet to relieve loads on the main landing gear. Failure to comply could result in damage to the landing gear during kneeling.

Courtesy of T.O. 1C-5A-1

This Galaxy was midway through a 180° taxi turn when the crew saw a metal light pole obstructing their path. In order to avoid the pole, the AC stopped the aircraft with the aft main landing gear still castered (left at 6° and right at 10°). Because the aft main landing gear were castered, the aircraft couldn't be moved forward or aft. The flight crew elected to individually kneel the aft main landing gear so the aircraft could be towed backward. Guess what? During the kneeling operation they damaged the kneeling components of the left aft main landing gear. It pays to read and heed.



Quick Stoppers

No Frills Flight

The crew of this C-141 decided to delay departure from their overseas location by 12 hours in hopes destination weather would improve significantly. Fleet service personnel were called to remove the 115 frozen meals they had previously loaded for the passengers (ice wasn't provided to keep the meals frozen). The crew returned to crew rest.

The following day, the crew showed at the aircraft (having received a significantly improved destination weather briefing) and began preparing the aircraft to transport their 100+ delayed passengers back to the CONUS. The loadmasters were informed by fleet service personnel that the same unrefrigerated, once-frozen meals, onloaded for the previous night's flight were again being loaded for the passengers. The senior loadmaster questioned this decision, reasoning that by this time the meals wouldn't be safe to eat. The aircraft commander told command post personnel they wouldn't accept the meals unless the base veterinarian or some other competent authority would certify the meals edible. A fleet service representative promptly arrived at the airplane and, conjuring up all the medical expertise he could muster, certified the meals as A-Okay, (however, it's not clear whether the fleet service rep volunteered to *taste* one).

The flight crew accepted the meals and pressed on with the mission. Approximately one-half hour after the meals were consumed, the senior loadmaster was informed several passengers were nauseous and several others were vomiting. The aircraft commander called ahead and arranged for medical authorities to meet them at their destination airport. By the time the aircraft landed, 17 people onboard were ill, 2 of which required ambulance assistance to the local medical facility. The attending physician diagnosed the symptoms as staphylococcal food poisoning.

After Deadlines

C-5 CREW GOES AROUND THE WORLD IN EIGHT DAYS—When science fiction writer Jules Verne envisioned man's ability to fly around the world in 80 days, he probably didn't think the trip could be made 10 times faster. But Military Airlift Command officials did and, in March, tasked a C-5 crew from from the 75th and 22d Military Airlift Squadrons to travel to Canada, Israel, Australia, and back to Travis on an eight-day airlift mission.

"We were tasked to carry 51 Canadian troops and 9 Huey helicopters from Edmonton to Ben Gurion International Airport in Tel Aviv, Israel, then pick up members of the Australian peacekeeping contingent and return them to Australia," said Capt. Pete Holzgang, a pilot from the 22d MAS.

Although the six C-5 aircrew members completed the 22,897-nautical-mile journey in eight days, the unique thing about the trip was loading the helicopters, according to Captain Holzgang. "It was the first time nine Hueys had been transported only partially disassembled," he said.

The C-5 was refueled once over Scotland during the13.5-hour flight to Isreal. After landing in Tel Aviv, the Canadian contingent got off and Australian troops and eight helicopters were loaded into the aircraft for the flight to Australia. Following rest and refueling stops in Egypt and Diego Garcia, the C-5 and crew landed in Canberra, where they were met by well-wishers. The crew made a final stop at Hickam AFB, Hawaii, before returning to Travis AFB.

MAC OFFICIALS: "NO EXPLOSIVES ON CONTRACT FLIGHTS"—Military Airlift Command safety officials warn Department of Defense travelers that transporting explosive material aboard contract flights is against military regulations and federal law.

The warning includes explosive materials carried in checked and carry-on baggage as well as those shipped with household goods, and follows a recent incident at a MAC aerial port in which service members were transporting blasting caps, detonating cord, 40mm rounds, hand grenade fuses, flares, smoke grenades, and various other articles.

MAC safety officials said the Federal Aviation Administration will make random checks of contract flights and will treat military members the same as civilians in cases where explosive items are found in baggage. Federal marshals can make on-the-spot arrests. Violators may face action under the Uniform Code of Military Justice and also be subject to federal prosecution.

C-47 FLANKS BERLIN AIRLIFT MEMORIAL—The Berlin Airlift Memorial project at Rhein-Main AB, West Germany, entered its second phase recently when a C-47, the first of two aircraft slated to flank the monument, was donated to the Luftbruecke Chapter of the Airlift Association. The U.S. Air Force Museum at Wright-Patterson AFB, Ohio, acquired the C-47 "Gooney Bird" with the help of Jim Cullen of West Air International in Monument, Colorado.

Officials also plan to acquire a C-54 to join the C-47 as part of the second phase. These were the primary aircraft used during the Berlin Airlift—dubbed "Operation Vittles"—in which more than 1.7 million tons of supplies were airlifted into Berlin over a 15-month period.

Remaining phases of the project include the rededication of the German-American friendship bridge, construction of a "Freedom of Flight" Conference and Visitors Center, and an international recreation area. When completed, the project will serve as a monument and educational complex dedicated to the Berlin Airlift, its participants, and the value of peace and freedom.

☆ US GOVERNMENT PRINTING OFFICE: 1986 654-326

Touch'n Go

What'd yamean gross navigation error! Isn't this Clark??